"The arrangement of this report is guided by the object of reaching the theory of these crucial phenomena as directly as possible. To make the treatment rather more elementary, use of the principle of least action and Hamiltonian methods has been avoided; and the brief account of these in Chapter VII is merely added for completeness. Similarly, the equations of electrodynamics are not used in the main part of the Report. Owing to the historical tradition, there is an undue tendency to connect the principle of relativity with the electrical theory of light and matter, and it seems well to emphasize its independence. The main difficulty of this subject is that it requires a special mathematical calculus, which, though not difficult to understand, needs time and practice to use with facility. In the older theory of relativity the somewhat forbidding vector products and vector operators constantly appear. Happily this can now be avoided altogether; but in its place we use the absolute differential calculus of Ricci and Levi-Civita."

Contents—I (Pages 1–13): The restricted principle of relativity; II (14–29): The relations of space, time, and force; III (30–40): The theories of tensors; IV (41–47): Einstein's law of gravitation; V (48–58): The crucial phenomena; VI (59–70): The gravitation of a continuous distribution of matter; VII (71–81): The principle of least action; VIII (82–91): The curvature of space and time.

NOTES.

The works of EVANGELISTA TORRICELLI, "edite in occasione del III centenario della nascita col concorso del Comune di Faenza da Gino Loria e Giuseppe Vassura," have been published in three volumes (about 1800 pages, Faenza, G. Montanari, 1919; price 60 lire). There is a valuable "Introduzione" (pages iii–xxxviii of the first volume) by Loria.

Vuibert (Paris) published in 1919 the first volume of a three-volume work by H. BROCARD and T. LEMOYNE entitled: *Courbes géométriques rémarquables (courbes spéciales) planes et gauches.* The volume contains 460 royal-octavo pages and is listed at 18 francs. It will soon be reviewed in this MONTHLY.

The Hydrographic Office, Washington, has recently published. *General Catalogue of Mariner's Charts and Books*, corrected to April 1, 1919 (293 pages). In Special Publication no. 60 of the U. S. Coast and Geodetic Survey, Mr. O. S. ADAMS makes *A Study of Map Projections in General* (24 pages). The author states that

"an attempt has been made to treat in simple form some of the fundamental ideas that underlie the subject of map projections in general. There has been no intention to develop any phase of the subject at any length, but merely to give briefly some suggestions under the different headings that, it is hoped, may be found helpful to those who wish to get an understanding of the subject."

The issue of *Nature* for November 6, 1919, was a "jubilee number" (84 pages), and contained about forty brief articles concerning progress in various phases of science. Sir Norman Lockyer, the founder of the journal, in November, 1869, wrote "Valedictory Memories," and H. Deslandres, director of the Astrophysical Observatory of Mendon, wrote the sketch of Sir Norman (of whom there is a fine portrait supplement) for the "Scientific Worthies" series. The article on "Science and the Church" is by Canon J. M. Wilson who states that he "was a fair mathematician" fifty years ago (he was a senior wrangler). Readers of *Euclid and his Modern Rivals* (1879, second edition, 1885) will recall that C. L. Dodgson (Lewis Carroll) and De Morgan found much to criticize in the Canon's

Elementary Geometry . . . following the Syllabus of Geometry prepared by the Geometrical Association.[1] His *Solid Geometry and Conic Sections* was familiar to a good many American students of mathematics of twenty-five years ago.

The *Journal für die reine und angewandte Mathematik* was founded by Crelle in 1826 with Gergonne's *Annales de mathématiques pures et appliquées* as a model. Success in the undertaking was partly assured through an arrangement he made with the Kultusministerium whereby he was allowed to add to the title of the *Journal* the words to be found even in volume 146, 1915: "Mit tätiger Beförderung hoher Königlich Preussischer Behörden." (It is a sign of the times that this legend does not appear in volume 149, 1919.) The "Beförderung" consisted on the one hand in issuing strong official recommendation of the *Journal* not only to universities, and institutions of a similar nature, but also, for example, to government boards and, through Prussian ambassadors, to foreign countries. On the other hand the "Beförderung" involved the purchase of a number of copies of the *Journal* which were distributed to various schools—a custom prevailing to very recent times. In this way Weierstrass, for example, while a gymnasium pupil, received inspiration by discovering an uncut copy of the *Journal* "mit den schönen Abhandlungen von Steiner, von denen auch ein Primaner etwas verstehen konnte."

ARTICLES IN CURRENT PERIODICALS.

ALUMNI BULLETIN, College of St. Thomas, St. Paul, Minn., volume 3, no. 1, February, 1919: "Rev. William Earnshaw Etzel," 14–15 [full page portrait, 14; died February 3, 1919; charter member of the Mathematical Association of America].

AMERICAN CATHOLIC QUARTERLY REVIEW, Philadelphia, volume 44, January, 1919: "Catholic church and the gentle science of numbers" by E. Von R. Wilson, 121–145.

AMERICAN MACHINIST, New York, volume 51, October 9, 1919: "The equation of the involute simplified" by N. Finkelstein, 693–694; "Cam design and construction" by F. De R. Furman, 695–698; "A little question in trigonometry" by K. H. Condit, 713–714.

AMERICAN STATISTICAL ASSOCIATION, Quarterly Publications, Boston, volume 16, September, 1919: "On functional relations for which the coefficient of correlation is zero" by H. L. Rietz, 472–476.

BULLETIN DES SCIENCES MATHÉMATIQUES, volume 54, May, 1919: Review by E. Picard of G. H. Halphen's *Oeuvres*, tome 2 (Paris, 1918), 105; "Mémoire relatif à l'étude des substitutions rationnelles à une variable" by G. Julia, 106–109; Review by G. Bigourdan of E. Belot's *L'origine des formes de la terre et des planètes* (Paris, 1918), 110–112; Review by R. le Vavasseur of F. X. Kugler's *Die Babylonische Mondrechnung* (Freiburg 1. B., 1900), *Sternkunde und Sterndienst in Babel-Assyriologische, astronomische und astralmytologische Untersuchungen* (Münster i. W., 1907–1913), and *Im Bannkreis Babels* (Münster i. W., 1910), 112–118; Review by E. Cahen of O. Hölder's *Die Arithmetik in Strenger Begründung* (Leipzig, 1914), 118–121; Review by P. du Plessis of H. von Sanden's *Praktische Analysis* (Leipzig, 1914), 121–124; "La série $\frac{1}{5}+\frac{1}{7}+\frac{1}{11}+\frac{1}{13}+\frac{1}{17}+\frac{1}{19}+\frac{1}{29}+\frac{1}{31}+\frac{1}{41}+\frac{1}{43}+\frac{1}{59}+\frac{1}{61}+\cdots$ où les dénominateurs sont 'nombres premiers jumeaux' est convergente ou finie" (suite et fin) by V. Brun, 124–128.—June: Review of E. J. Boudin's *Leçons de calcul des probabilites* faites à l'Université de Gand de 1846 à 1890, publieés avec des Notes et des additions par P. Mansevi (Paris, 1916), 129–133; Review by G. Loria of P. Duhem's *Système du monde*, tome 5 (Paris, 1917), 133–135; Review by E. Lebon of F. Frenet's *Recueil d'exercices sur le calcul infinitésimal* (seventh edition, Paris, 1917), 135–136; Review by E. Ouivet of A. Schoenflies's *Entwicklung der Mengenlehre und ihrer Anwendungen*, part 1 (Leipzig,

[1] That is, the A. I. G. T. (Association for the Improvement of Geometrical Teaching) afterwards the Mathematical Association.